

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



10/534533 4533



(43) International Publication Date
3 June 2004 (03.06.2004)

PCT

(10) International Publication Number
WO 2004/045991 A1

(51) International Patent Classification⁷: B65F 1/06,
1/10, B65B 9/02

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(21) International Application Number:
PCT/IL2003/000968

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(22) International Filing Date:
16 November 2003 (16.11.2003)

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR,
CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN,
MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU,
SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0226807.6 15 November 2002 (15.11.2002) GB
0315652.8 3 July 2003 (03.07.2003) GB

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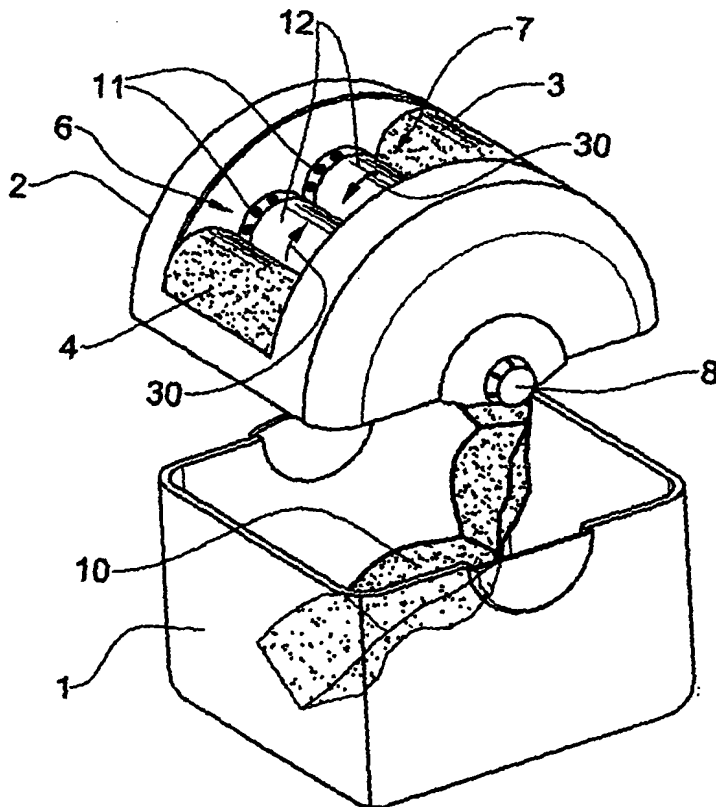
(84) Designated States (*regional*): ARIPO patent (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE,

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[Continued on next page]

(54) Title: BIN WITH MECHANISM FOR WRAPPING AN ITEM TO BE STORED THEREIN



(57) Abstract: A storage bin having a mechanism (2) for wrapping objects to be stored in the bin. The bin comprises two trays (4,5) configured to receive a roll of self-adhesive film (3). Two rollers (6,7) are rotated in an insertion direction (30) by a driving mechanism so as to cause an object (9) to pass between the rollers (6,7) into a container (1) as the object (9) becomes wrapped in the self-adhesive film (3).

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SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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Published:

— with international search report

BIN WITH MECHANISM FOR WRAPPING AN ITEM TO BE STORED THEREIN

FIELD OF THE INVENTION

This invention relates to storage bins.

BACKGROUND OF THE INVENTION

It is often desirable that a stored item be separated from its environment. For
5 example, an item producing a foul odor, such as a used diaper, should be separated
from its environment by a barrier impervious to the odor so as to prevent the odor
from being released into the environment. To accomplish this it is known to store
items such as used diapers in a bin having a tightly fitting cover. This, however,
does not prevent the odor from escaping into the room when the bin is periodically
10 opened to insert an additional used diaper.

Similarly, a food, such as a sandwich or fruit, to be stored should be
separated from its environment in order preserve the freshness of the item or to
prevent contamination or drying out by the environment. To accomplish this, it is
known to store food items in sealed containers.

15 SUMMARY OF THE INVENTION

The present invention provides a bin for storing items. In accordance with
the invention, as an item is inserted into the bin, it becomes individually wrapped
with a self-adhering film such as a saran (i.e. a plastic having vinylidene chloride as
its principal monomer). The bin comprises a base container for storing the wrapped
20 items below a wrapping assembly. The wrapping assembly includes two trays
configured to receive a roll of self-adhering film.

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The wrapping assembly also includes a first and second cylindrical rollers. Rotation of the rollers are coupled to each other so that rotation of the first roller, for example by means of a knob, in one direction causes simultaneous rotation of the second roller in the opposite directions

5 In use, a small amount of the film is extended by hand from each roll and the ends are pressed together. Due to the self-adhesiveness of the film, the ends of the two rolls of film are thus bonded together. The bonded edge is then manually fed in between the rollers as the rollers are made to rotate. This causes the two sheets of film to pass between the rollers into the base container. As the two sheets of film
10 pass between the rollers they are crimped together by the end sections of the rollers so as to bind the two sheets together along the edges.

An object to be stored in the bin, such as a soiled diaper or food item, is now placed between the two rolls of a film over the rollers. The rollers are then rotated so as to draw the bonded edge of film further into the container. As the sheets of
15 film pass into the container, the object passes between the rollers. As the object passes between the rollers crimping of the film at the end sections of the rollers seals the two rolls of film around the object. After the object has passed between the rollers, the two rolls of film may be cut. The rolls of film are preferably perforated at intermittent intervals to facilitate manual cutting of the film by a user. The cut
20 ends of the two sheets of film wrapping the object are then manually pressed together so as to bond the ends together. Further rotation of the rollers causes the object, now completely wrapped in the film, to be released from the rollers and to fall into the container.

The invention thus provides a bin for storing objects comprising:

- 25 (a) a container;
(b) a first tray and a second tray, each tray configured to receive a roll of self-adhesive film.
(c) a first roller and a second roller;
(d) driving means rotating the first and second rollers in an insertion direction.

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BRIEF DESCRIPTION OF THE DRAWINGS

In order to understand the invention and to see how it may be carried out in practice, a preferred embodiment will now be described, by way of non-limiting example only, with reference to the accompanying drawings, in which:

5 **Fig. 1** shows an exploded view of a bin in accordance with one embodiment of the invention;

Fig. 2 shows the bin of Fig. 1 with the film covers in an open state exposing the rolls of film;

Fig. 3 shows the bin of Fig. 1 with the film covers closed over the rolls of
10 film;

Fig. 4 shows insertion of an object between into the bin of Fig. 1;

Fig. 5 shows a bin having a lid and a cover in accordance with another embodiment of the invention;

Fig. 6 shows the top assembly of the bin of Fig. 5 with the lid in an open
15 state;

Fig. 7 shows the underside of the top assembly shown in Fig. 6;

Fig. 8 shows the top assembly of the bin shown in Fig. 5 with the cover removed;

Fig. 9 shows the underside of the top assembly of the bin of Fig. 5 showing
20 protective blades;

Fig. 10 shows the top assembly of the bin of Fig. 5 showing a ratchet system for allowing rotation of rollers in a single direction;

Fig. 11 shows the underside of the top assembly of the bin of Fig. 5 with an object wrapped in self-adhering film after having passed between the rollers; and

25 **Fig. 12** shows the drive system of the bin of Fig. 5.

DETAILED DESCRIPTION OF THE INVENTION

Figs. 1 to 4 show a first embodiment of a bin in accordance with the invention. The bin is shown in exploded view in Fig. 1. The bin comprises a base container 1 supporting a wrapping assembly 2. The wrapping assembly 2 includes

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two trays 4 and 5 (Fig. 2). Each of the trays 4 and 5 are configured to receive a roll of self-adhering film 3. The self-adhering film 3 may be formed, for example, from a saran (i.e. a plastic having vinylidene chloride as its principal monomer). To place a roll of film 3 in each of the trays 3 and 4, covers 10 are opened to expose the trays 4 and 5 (Fig. 2). After a roll of film 3 has been placed in each of the trays 4 and 5 (Fig. 1), the covers 10 are closed over the rolls of film 3 (Figs. 3 and 4).

Adjacent to the rolls of film 3 is a pair of cylindrical rollers 6 and 7. The rollers 6 and 7 are constructed in three sections. The rollers 6 and 7 have a central section 12 formed from a resiliently compressible material such as foam rubber. An end section 11 at each end of both rollers 6 and 7 is formed from a hard material. The end sections 11 are toothed into a gear like surface so that surface of each end section of one of the rollers engages the surface in the adjacent end section of the other roller. Rotation of a knob 8 rotates the roller 6. Rotation of the roller 6 in one direction by the knob 8 causes simultaneous rotation of the roller 7 in the opposite directions by the gear interaction between the rollers 6 and 7 at the end regions 11. In use, the knob 8 is used to rotate the rollers 6 and 7 simultaneously in an insertion direction indicated by the arrows 30.

In use, a small amount of the film 3 is extended by hand from each roll and the ends are pressed together. Due to the self-adhesiveness of the film, the ends of the two rolls of film are thus bonded together. The bonded edge is then manually fed in between the rollers 6 and 7 as the rollers are made to rotate in the insertion direction by turning the knob 8. This causes the two sheets of film 3 to pass between the rollers 6 and 7 into the base container 1. As the two sheets of film 3 pass between the rollers 6 and 7, they are crimped together by the gear surfaces in the end sections 11 so as to be bonded together there.

An object 9 to be stored in the bin, such as a soiled diaper or sandwich, is now placed between the two rolls of a film 3, over the rollers 6 and 7, as shown in Fig. 4. The knob 8 is then rotated so as to rotate the rollers 6 and 7 in the insertion direction and draw the bonded edge of film further into the container 1. As the sheets of film 3 pass into the container 1, the object 9 passes between the rollers 6

- 5 -

and 7. As the object 9 passes between the rollers 6 and 7 the material of the central region on both rollers 6 and 7 is temporarily compressed so as to allow the object 9 to pass between the rollers 6 and 7. As this occurs, crimping of the film 3 at the end sections 11 of the rollers 6 and 7 seals the two rolls of film 3 around the object 9.

5 Furthermore, as the object 9 passes between the rollers 6 and 7, the two sheets of film are pressed against the object so as to prevent a significant amount of air from being trapped between the film 3 and the object 9. After the object 9 has passed between the rollers 6 and 7, the two rolls of film 3 may be cut. The rolls of film 3 are preferably perforated at intermittent intervals to facilitate manual cutting of the

10 film 3 by a user. The cut ends of the two sheets of film 3 wrapping the object 9 are then manually pressed together so as to bond the ends together. Further rotation of the rollers 6 and 7 by the knob 8 causes the object 9, now completely wrapped in the film 3, to be released from the rollers 6 and 7 and to fall into the container 1. Alternatively, the two sheets of film 3 are not cut after the object 9 has passed

15 between the rollers 6 and 7 into the container 1. Instead, the two sheets of film 3 become bonded together above the object 9 as the film continues to pass between the rollers 6 and 7 after the object 9 has passed between the rollers 6 and 7. In this case, several objects may be wrapped together in the film 3 as shown in Fig. 1.

Figs. 5 to 12 show a bin in accordance with a second embodiment of the

20 invention. The embodiment of Figs. 5 to 12 has elements in common with the embodiment of Figs. 1 to 4, and similar components are referred to by the same reference numeral, without further comment or explanation.

The embodiment of Figs. 5 to 12 has a lid 13 supported by two arched and toothed supports 15. The each support 15 engages a drive gear wheel 17 at a

25 different end of the roller 6. When the lid 13 is closed, each support 15 engages its drive gear wheel 17 in a rack-and-pinion mechanism so as to cause the drive gear wheel 17 to rotate in the direction of the arrow 28. (Fig. 12) An inner wheel 25 is rigidly fixed to an axle 26 of the roller 6. The inner wheel 25 supports a series of pawls 18. The pawls 18 are positioned so as to engage with teeth 27 on the inner

30 surface of the drive gear wheel 17 in a ratcheted engagement. Thus, rotation of the

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drive gear wheel 17 by the supports 15 when the lid is closed causes the inner wheel 25, and hence the roller 6 to rotate in the same direction. Rotation of the roller 6 causes simultaneous rotation of the roller 7 by the gears in the end sections 11, so that the rollers 6 and 7 rotate in the insertion direction (arrows 28 and 29) as the lid 13 is closed. When the lid 13 is opened, each gear drive wheel 17 rotates in the direction opposite to that of the arrow 28 and slips over the inner wheel 25. This engagement prevents rotation of the rollers 6 and 7 when the lid 13 is opened.

In use, a small amount of the film 3 is extended by hand from each roll and the ends are pressed together. Due to the self-adhesiveness of the film, the ends of the two rolls of film are thus bonded together. The bonded edge is then manually fed in between the rollers 6 and 7. Feeding of the film between the rollers 6 and 7 may be facilitated by partially closing and opening the lid 13 one or more times. This causes the two sheets of film 3 to pass between the rollers 6 and 7 into the base container 1. As the two sheets of film 3 pass between the rollers 6 and 7, they are crimped together by the gear surfaces in the end sections 11 so as to be bonded together there.

An object 9 to be stored in the bin, such as a diaper or sandwich, is now placed between the two rolls of a film 3, over the rollers 6 and 7. The lid 13 is then closed so as to rotate the rollers 6 and 7 in the insertion direction and draw the bonded edges of film further into the container 1. As the sheets of film 3 pass into the container 1, the object 9 passes between the rollers 6 and 7. As the object 9 passes between the rollers 6 and 7 the material of the central region on both rollers 6 and 7 is temporarily compressed so as to allow the object 9 to pass between the rollers 6 and 7. As this occurs, crimping of the film 3 at the end sections 11 of the rollers 6 and 7 seals the two rolls of film 3 around the object 9. Furthermore, as the object 9 passes between the rollers 6 and 7, the two sheets of film are pressed against the object so as to prevent a significant amount of air from being trapped between the film 3 and the object 9. After the object 9 has passed between the rollers 6 and 7, the lid 13 may be opened, and the two rolls of film 3 may be cut above the object 9. The rolls of film 3 are preferably perforated at intermittent

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intervals to facilitate manual cutting of the film 3 by a user. The cut ends of the two sheets of film 3 wrapping the object 9 are then manually pressed together so as to bond the ends together. Further rotation of the rollers 6 and 7 closing the lid 13 causes the object 9, now completely wrapped in the film 3, to be released from the rollers 6 and 7 and to fall into the container 1. Alternatively, the two sheets of film 3 are not cut after the object 9 has passed between the rollers 6 and 7 into the container 1. Instead, the two sheets of film 3 become bonded together above the object 9 as the film continues to pass between the rollers 6 and 7 after the object 9 has passed between the rollers 6 and 7. In this case, several objects may be wrapped together in the film 3.

A cover 14 may optionally be positioned at the rolls of film 3. The cover 14 has an aperture 21 in the cover 14 through which an object to be wrapped and stored in the container 1 is passed. The aperture 21 is positioned so as to position the object 9 over the central region 12 of the rollers 6 and 7 in order to achieve optimal wrapping. The aperture 21 may also serve to limit the size of objects that can be stored in the container 1.

Below the compliant rollers 6 and 7 are deflection blades 19 and 20. The deflection blades 19 and 20 part as a wrapped object passes between them. The deflection blades 19 and 20 prevent contact of the wrapped object with film on the bottom sides of the rollers 6 and 7 which might cause film to unwrap from the object.

CLAIMS:

1. A bin for storing objects comprising:
 - (a) a container;
 - (b) a first tray and a second tray, each tray configured to receive a roll of self-
5 adhesive film.
 - (c) a first roller and a second roller;
 - (d) driving means rotating the first and second rollers in an insertion direction so as to move an object between the first and second rollers, into the container.
2. The bin according to claim 1, wherein the object is a diaper or a food item.
- 10 3. The bin according to any one of the proceeding claims wherein the rollers have a toothed end section at each end of the roller, the toothed end section at an end of one roller engaging the toothed end section at an adjacent end of the other roller.
4. The bin according to any one of the previous claims wherein the rollers
15 have a central section formed from a resiliently compressible material.
5. The bin according to Claim 4 wherein the resiliently compressible material is foam rubber.
6. The bin according to Claim 3 wherein the driving mechanism comprises a knob such that rotation of the knob drives rotation of the first roller.
- 20 7. The bin according to any one of the previous claims further comprising a lid.
8. The bin according to Claim 7 wherein the lid is supported by a pair of toothed supports, each support engaging a drive gear wheel located at a different end of the first roller so that when the lid is being closed, each support engages its
25 drive gear wheel so as to cause the drive gear wheel to rotate.
9. The bin according to Claim 8, wherein rotation of the drive gear wheels when the lid is being closed causes the first and second rollers to rotate in the insertion direction.

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10. The bin according to Claim 9 wherein the first and second rollers do not rotate when the lid is opened.

11. The bin according to Claim 10 comprising an inner wheel located inside each drive gear wheel, wherein each inner wheel supports one or more pawls, each
5 pawl positioned so as to engage with a tooth on an inner surface of the drive gear wheel when the lid is being closed so that rotation of the drive gear wheel when the lid is being closed causes rotation of the inner wheel.

12. The bin according to Claim 11 wherein the drive gear wheel slips over the inner wheel when the lid is being opened.

10 13. The bin according to any one of the previous claims further comprising two rolls of self-adhesive film.

14. The bin according to Claim 10 wherein the film is a saran.

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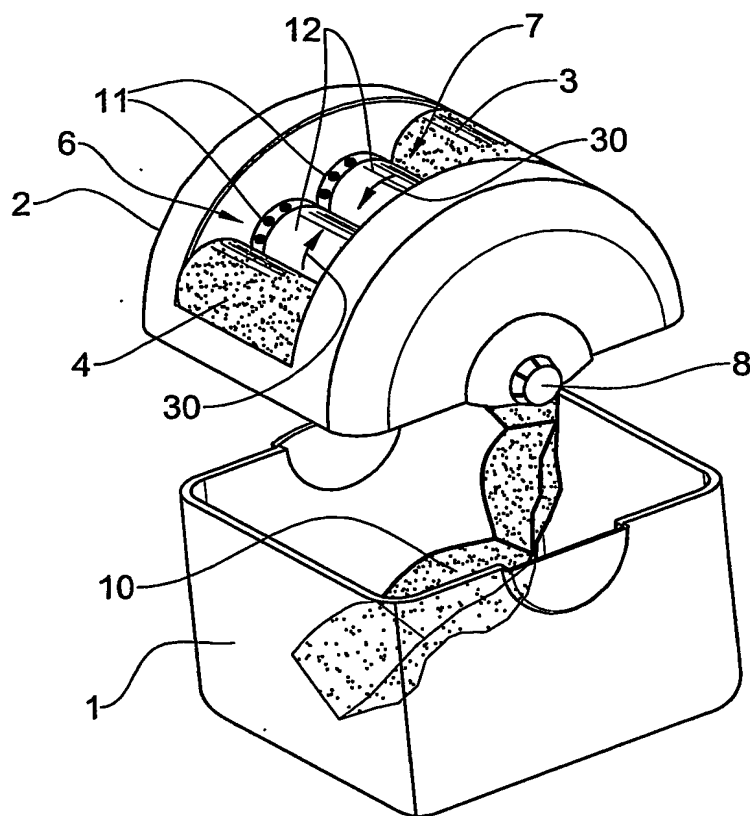


FIG. 1

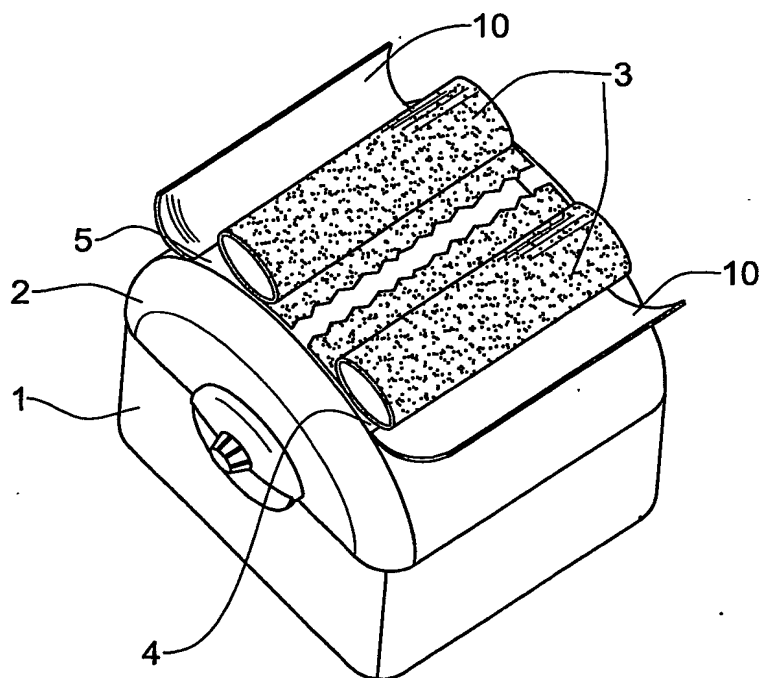


FIG. 2

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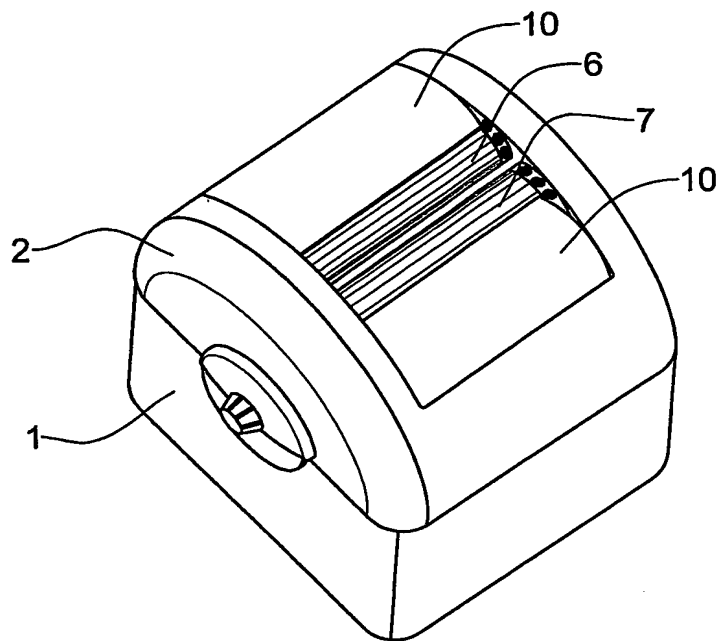


FIG. 3

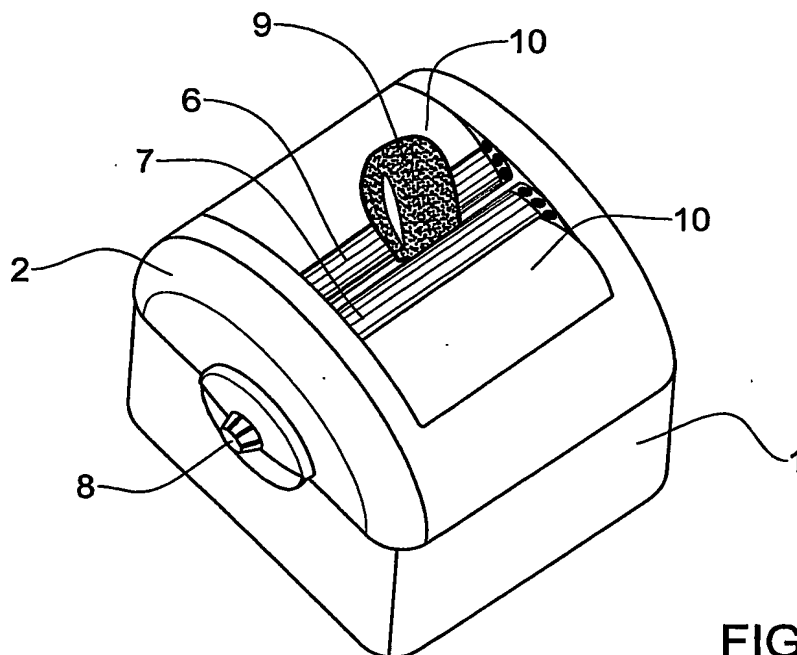


FIG. 4

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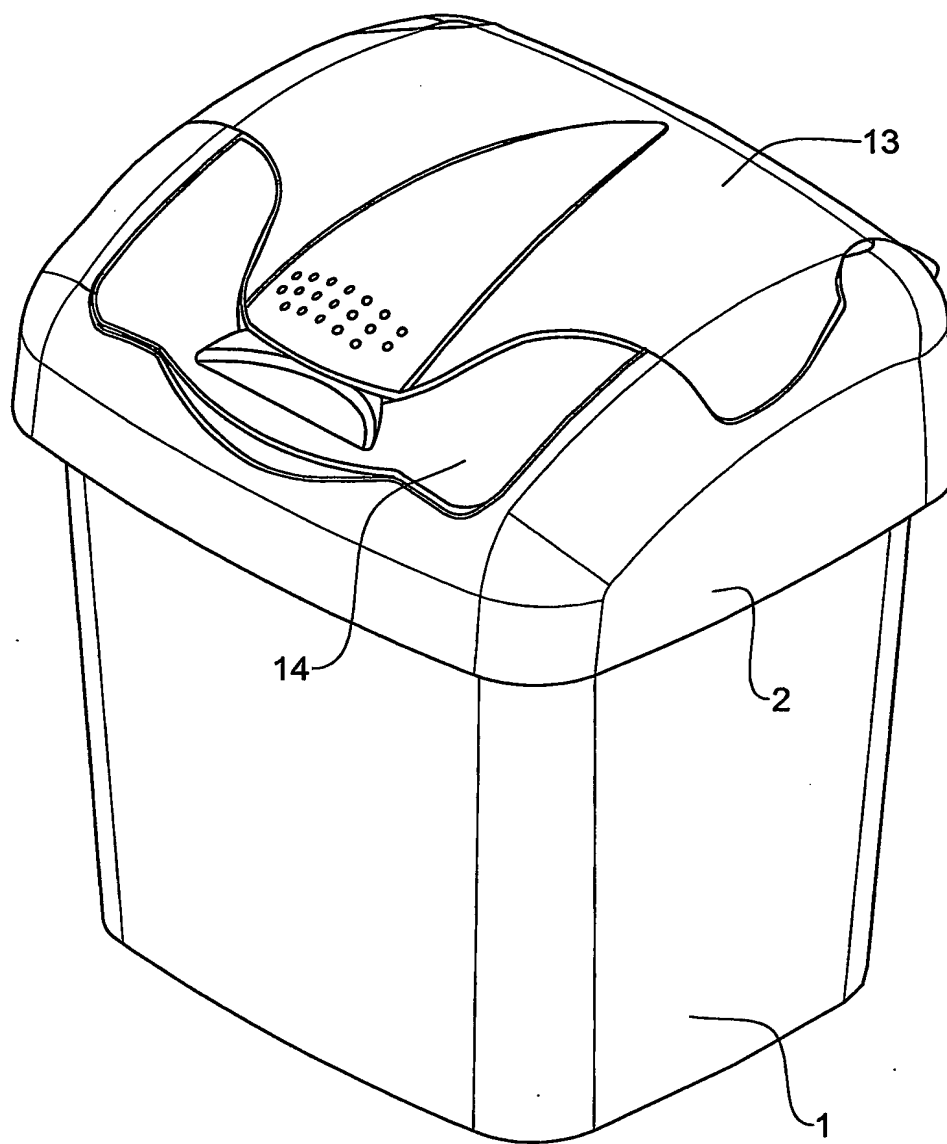


FIG. 5

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FIG. 6

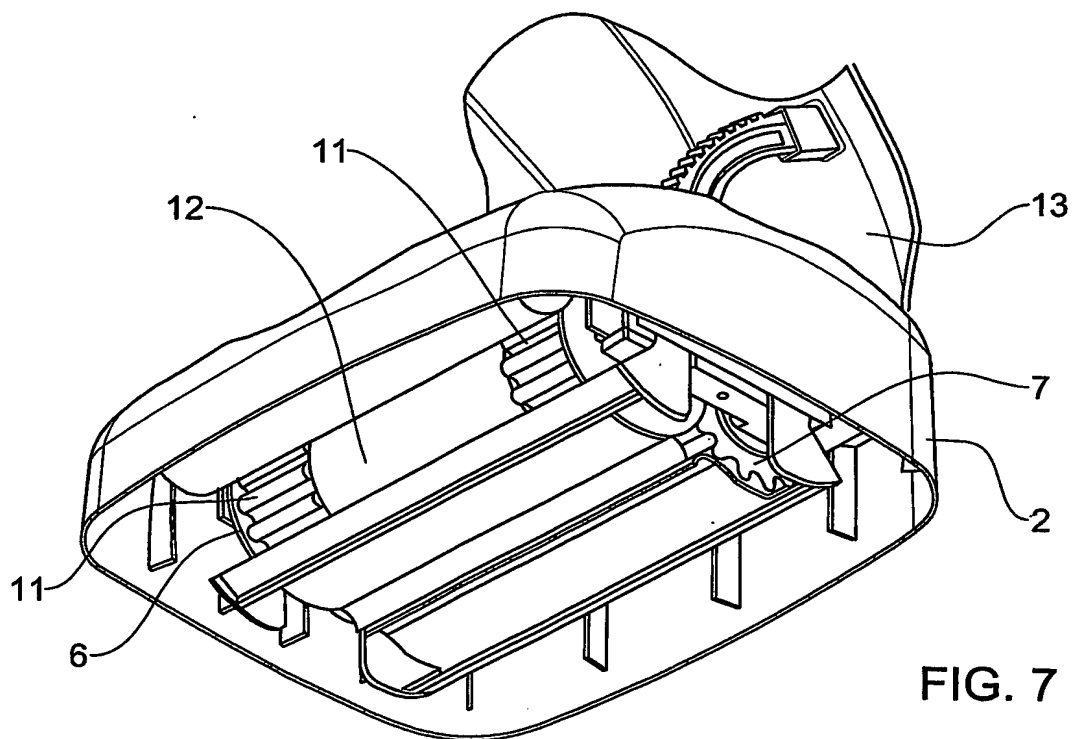
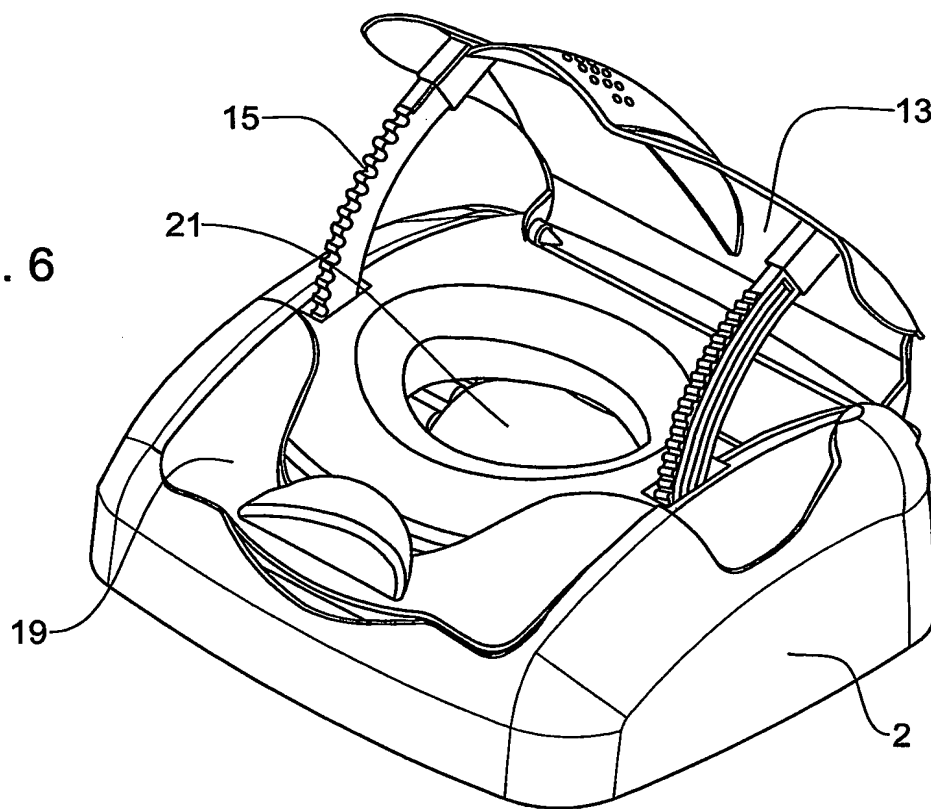


FIG. 7

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FIG. 8

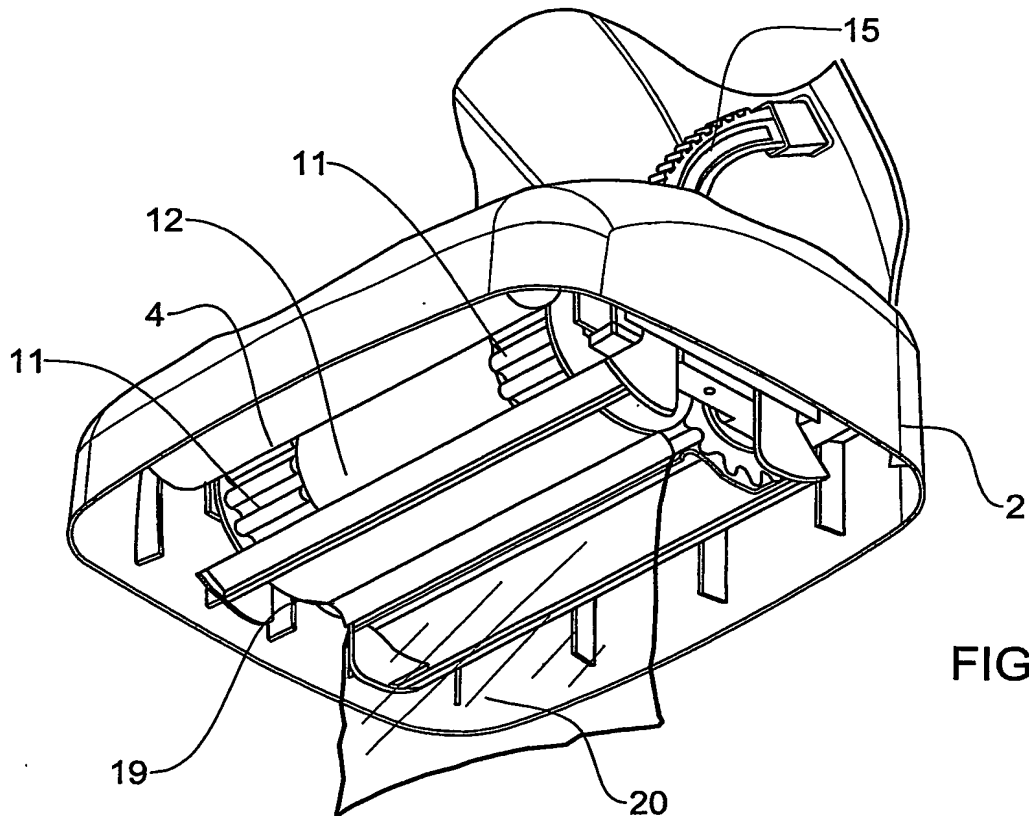
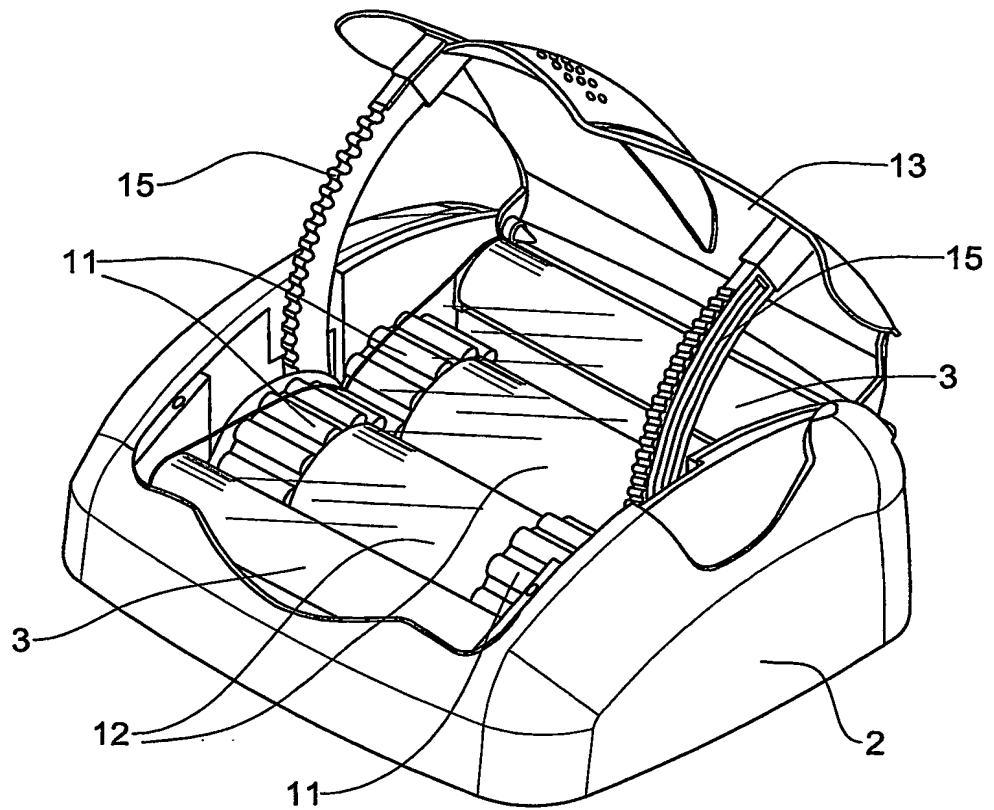


FIG. 9

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FIG. 10

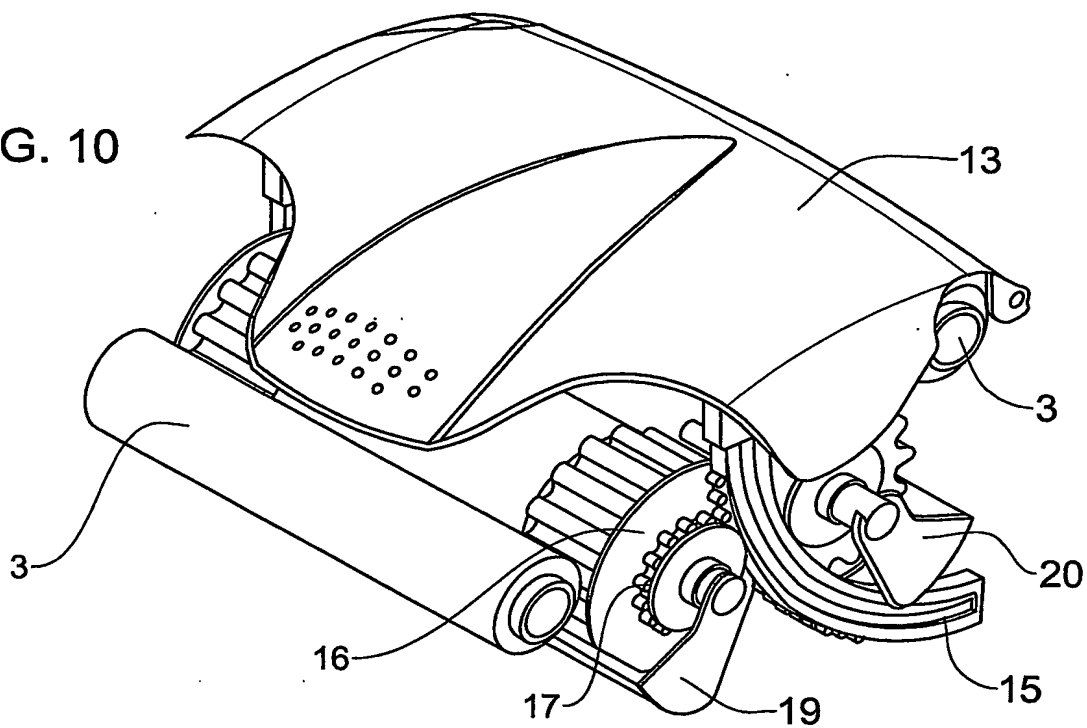
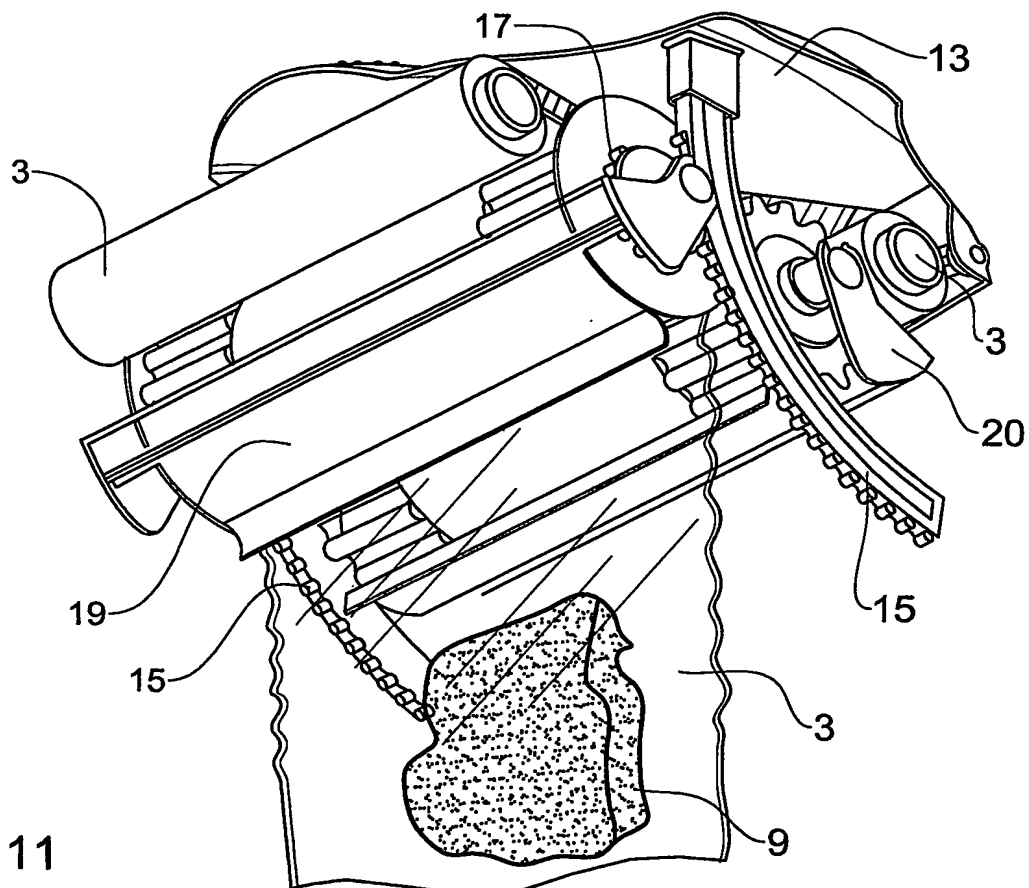


FIG. 11



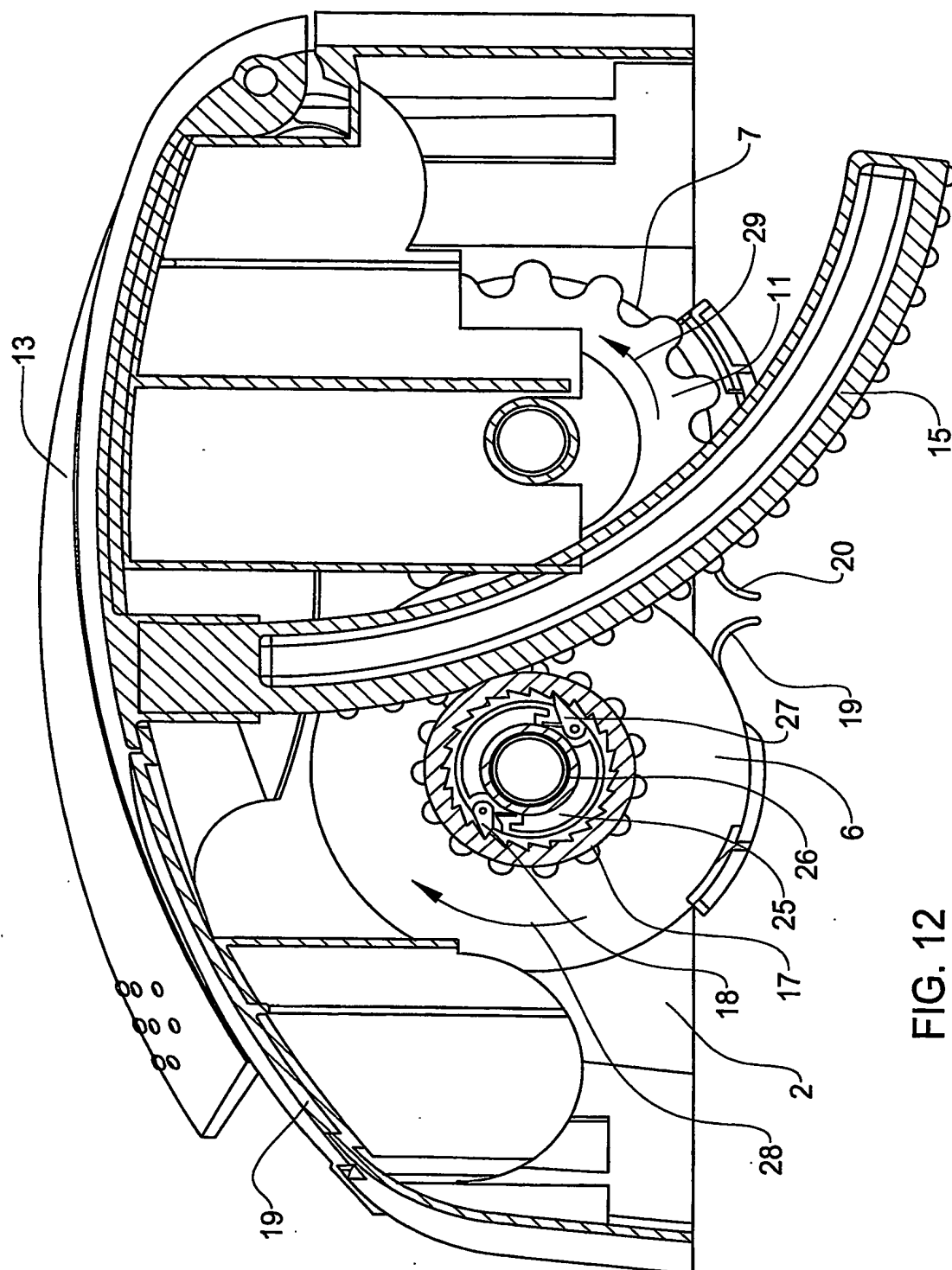


FIG. 12

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/IL 03/00968

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 B65F1/06 B65F1/10 B65B9/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 B65F B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	US 2 586 580 A (J. TRUSCOTT) 19 February 1952 (1952-02-19) column 1, line 1 - line 10 column 2, line 5 - line 47 figure 1	1-10,13, 14
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Patent family members are listed in annex.

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Date of the actual completion of the international search

8 March 2004

Date of mailing of the international search report

15/03/2004

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/IL 03/00968

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